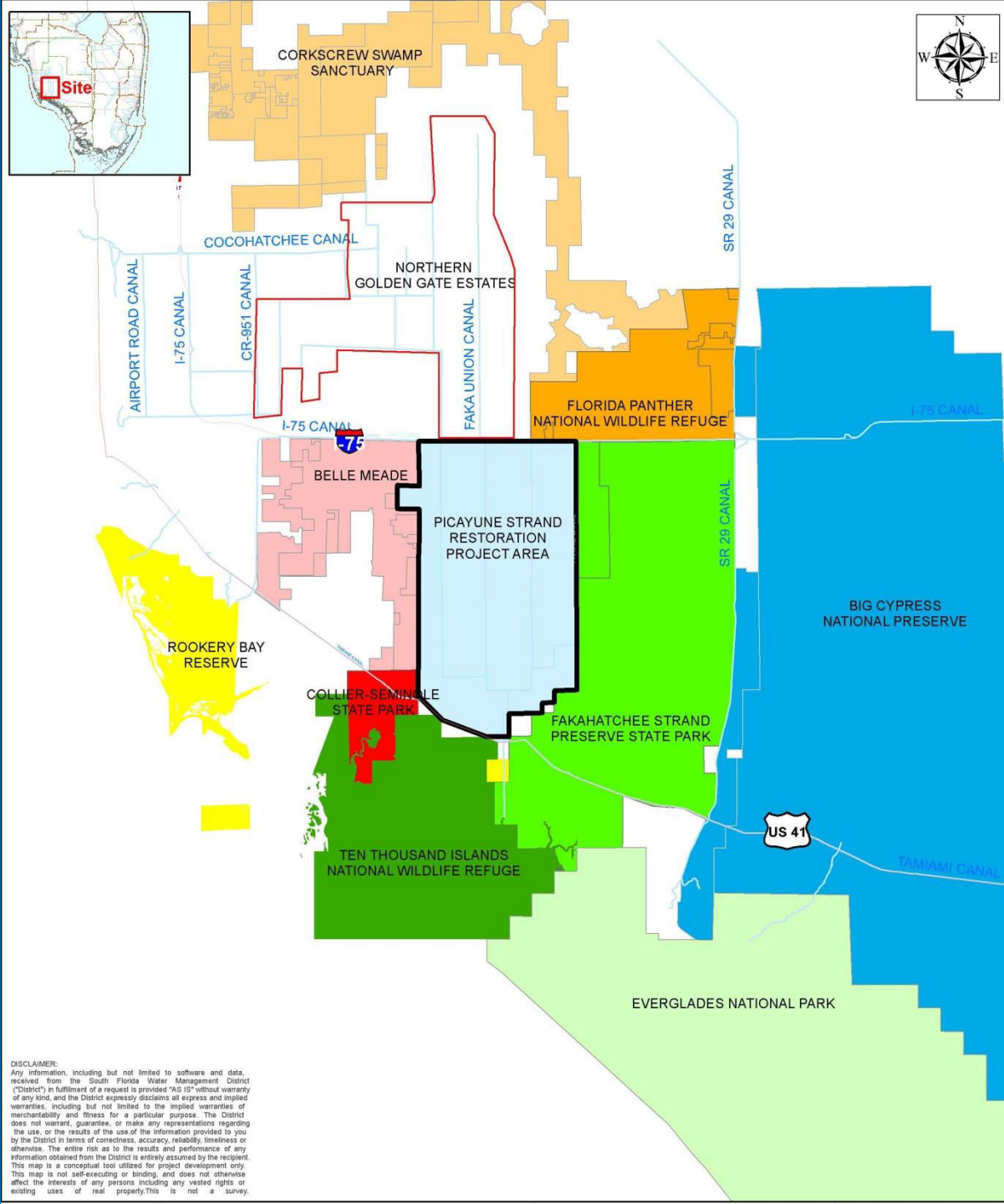


Picayune Strand Restoration Project: Some of the Lessons Learned

**Mike Duever
Natural Ecosystems**

Picayune Strand Restoration Project and Surrounding Conservation Lands

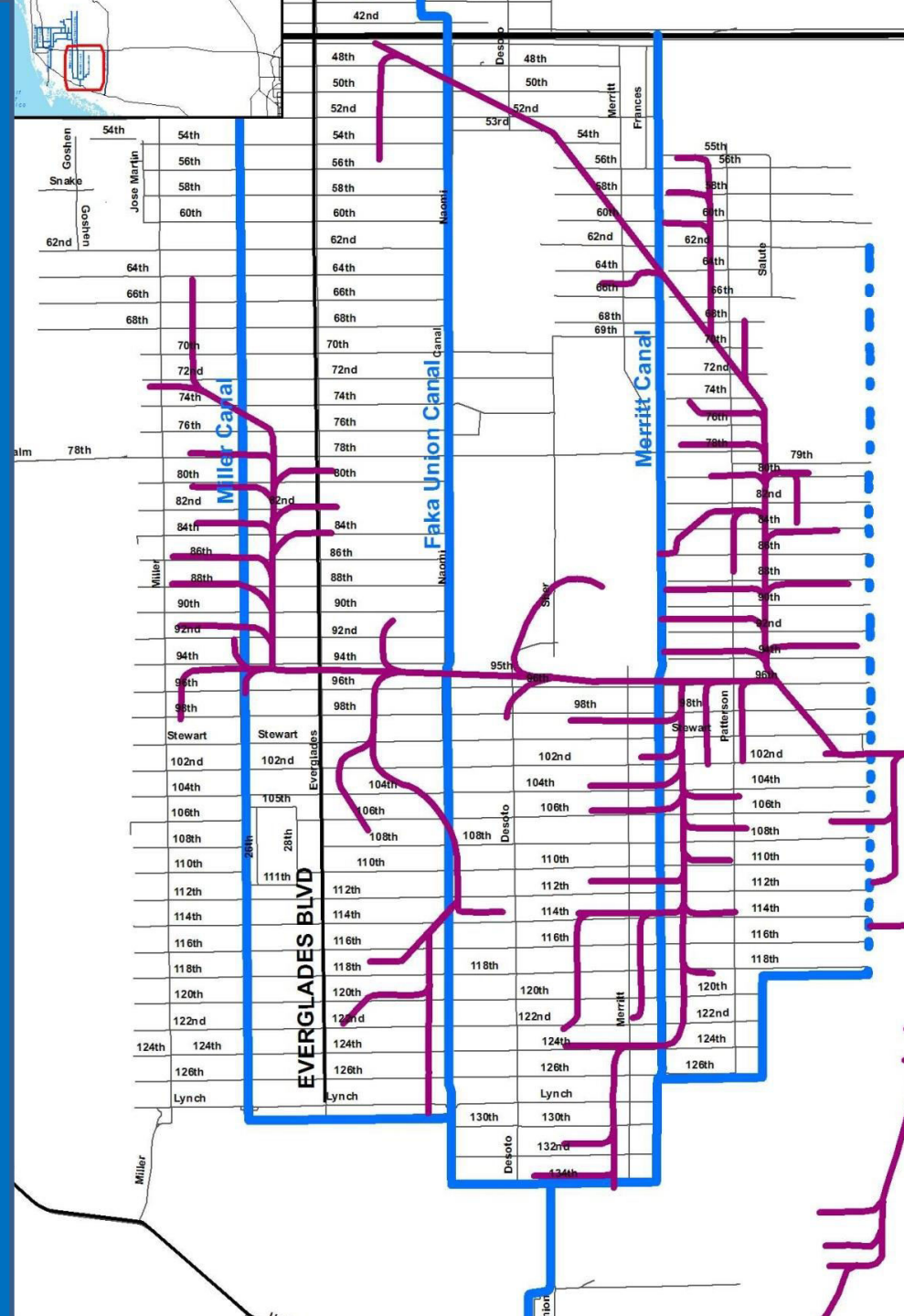


Picayune Strand Restoration Project

Roads (285 miles)

Logging Trams
(62 miles)

Canals (48 miles)

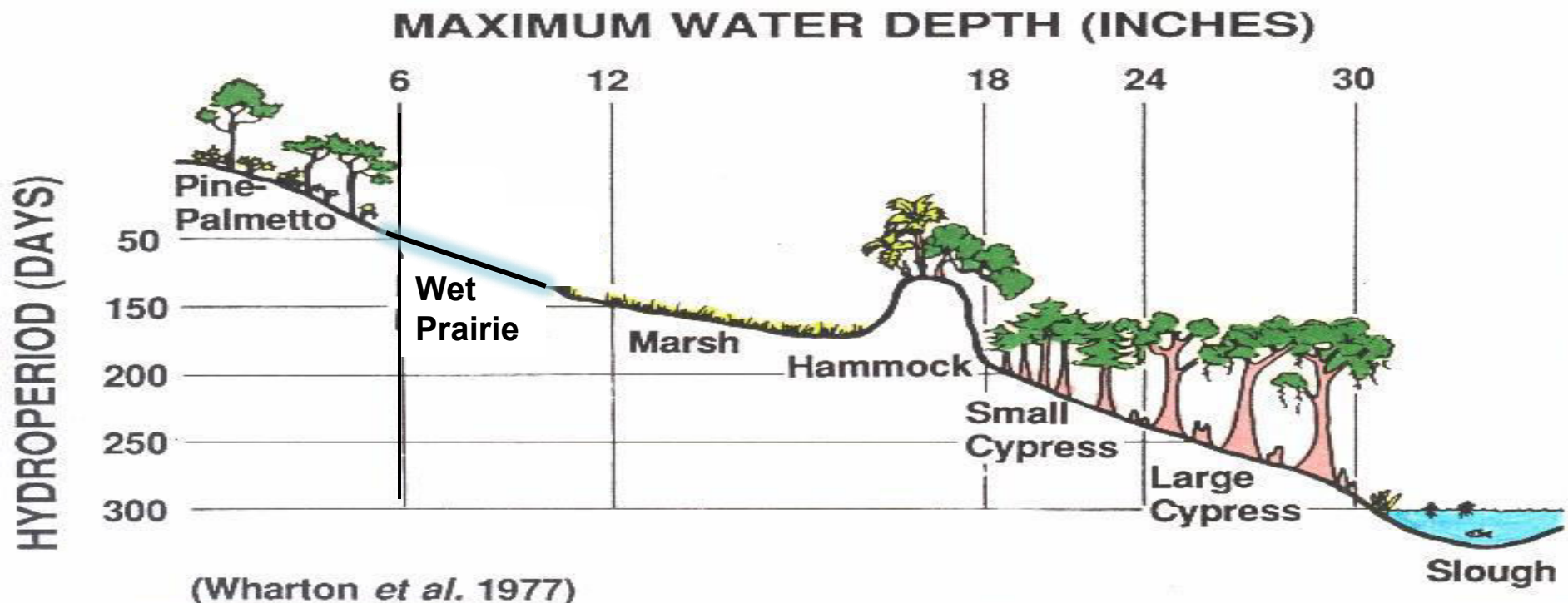




Ecological Basis for Picayune Restoration

Full Range of Wetland Communities Exists Over a 24" Topographic Gradient

HYDROPERIODS AND MAXIMUM WATER DEPTHS



Hydrologic Restoration

- **Sheet flow is Key to Restoration**
 - **Eliminate Wet Season Surface Water Drainage**
 - Plug Canals – **Effects Extend 1+ Miles**
 - **Eliminate Dry Season Groundwater Drainage**
 - Fill Most of Length of Canals – **Effects 2-3 Miles**
 - **Remove All Unnaturally Elevated Substrates**
 - Roads
 - Logging Trams
 - Home Sites
 - Spoil Associated with Roads and Canals

Restoring Sheetflow

- Remove Vegetation from Roads, Logging Trams, and Canals to Expose Above Natural Grade Spoil
- Degrade Spoil and Place Excess Material Above Natural Grade in Canals
- Minimal Area Impacted

Problems Encountered During the Prairie Canal Construction Phase



The background is an aerial photograph of a construction site. A grid of blue lines is overlaid on the terrain. Two arrows point upwards from the 'Lines of Missed Spoil' box to two horizontal blue lines. Two other arrows point from the same box to two diagonal blue lines that cross the grid.

Lines of Missed Spoil

**Very Poor Job of Degrading and
Leveling Construction Footprints**

Narrower or Shallower Canals

Reviewed DODRs (30, 60, 90% Design)

- **Width of Road Clearing**
- **Locating Logging Trams**

Road





Width of Road Removal

- **Started with 100 ft from Road Centerline**
 - But Spoil Surveys Often Went Only 75 ft
- **Went to 250 ft Wide in Plans**
 - Varies as a Function of Distribution of Spoil
- **Not Centered on Road**

Reviewed DODRs (30, 60, 90% Design)

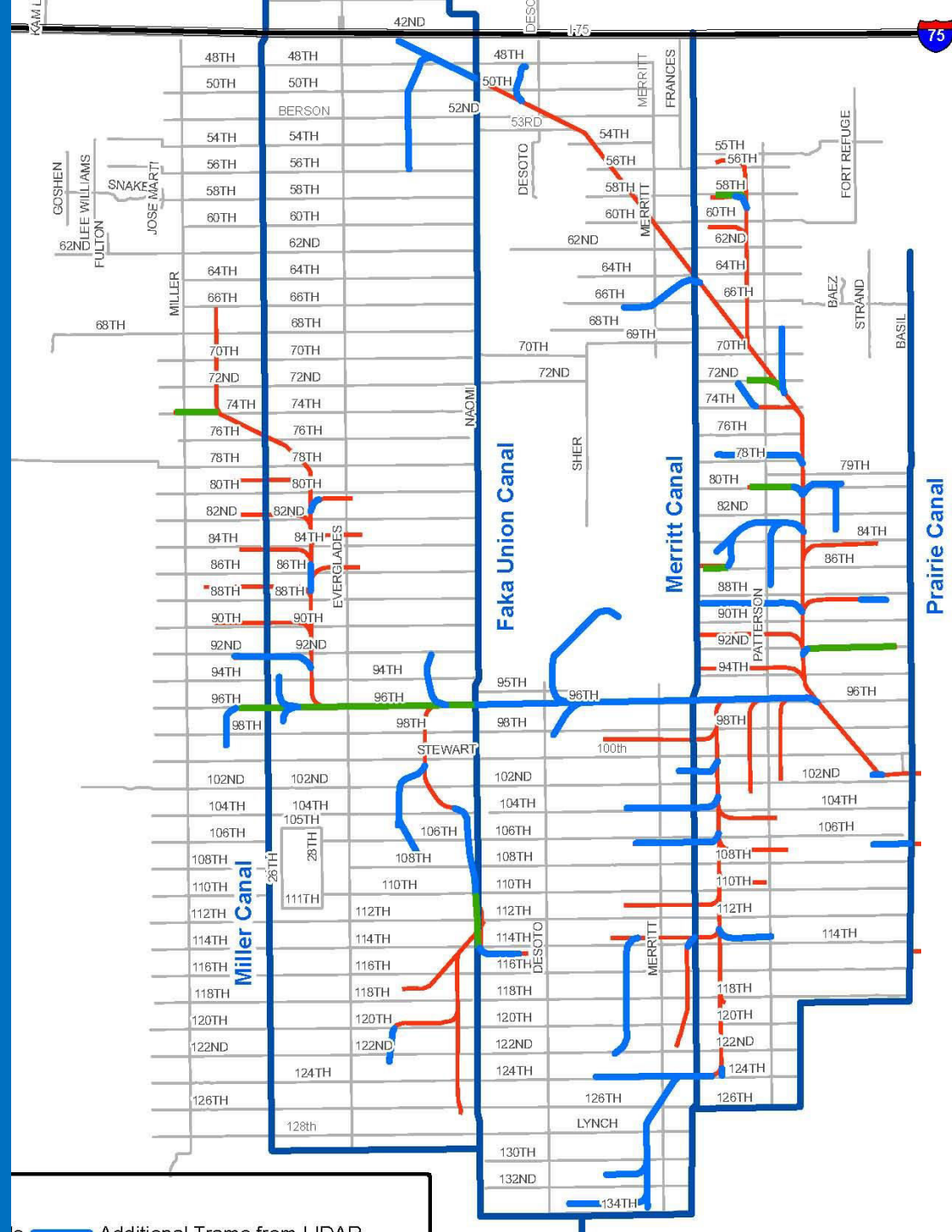
- **Width of Road Clearing**
- **Locating Logging Trams**

Picayune Logging Trams (62 miles)

**Trams Found
By Contractor** — **53%**
(33 miles)

**Trams I Found
Using 1962 and
1980 Aerial Photos** — **39%**
(24 miles)

**Eliminated by
Road or Canal
Construction** — **8%**
(5 miles)



Filling and Leveling Canals



PURPOSE OF THE WORK

THE PICAYUNE STRAND RESTORATION PROJECT (PSRP), FORMERLY THE SOUTHERN GOLDEN CAIT ESTATES (SGCE) ECOSYSTEM RESTORATION PROJECT, WILL RESTORE APPROXIMATELY 55,000 ACRES OF SENSITIVE ENVIRONMENTAL LAND LOCATED IN SOUTHWESTERN COLLIER COUNTY, FLORIDA TO ITS PREDEVELOPMENT CONDITION.

THE OBJECTIVE OF THE MERRITT PUMPING STATION, LEVEES, SPREADER BERM CONSTRUCTION, AND PLUGGING OF THE MERRITT CANAL PROJECT IS TO COLLECT THE WATER FROM THE NORTHERN PORTION OF THE MERRITT CANAL AREA, AND PUMP IT OVER THE SPREADER BERM WEIRS TO REESTABLISH SHEET FLOW IN THE AREA SOUTH AND EAST OF THE MERRITT CANAL.

CERTAIN AREAS WITHIN THE PROJECT AREA HAVE SPECIFIC REWORK REQUIREMENTS, SUCH AS DEGRADING, REWORKING, AND REGRADING, ETC. SEE NOTES UNDER WORK DESCRIPTION SECTION FOR SPECIFIC DETAILS.

GENERAL

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES, REGULATIONS, CRITERIA AND ORDINANCES HAVING JURISDICTION OVER THE PROJECT.
2. ALL WORK FOR THIS PROJECT SHALL CONFORM TO STANDARDS PUBLISHED BY RECOGNIZED PROFESSIONAL AND INDUSTRY ORGANIZATIONS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE PRIOR TO BIDDING AND FAMILIARIZING HIMSELF WITH ALL EXISTING CONDITIONS AFFECTING THE PROJECT. CONTRACTOR SHALL NOT LIMITED TO PRIVATE AND PUBLIC UTILITIES, ON AND OFF SITE, ACCESS ROADS, AND OTHER SUPPORT FACILITIES.

4. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE CONTRACTING OFFICER PRIOR TO ANY CHANGES OR DEVIATION FROM CONTRACT DOCUMENTS.

5. CONTRACTOR SHALL PREPARE AND MAINTAIN ALL CONSTRUCTION AREAS, AS WELL AS SURROUNDING AREAS, FREE OF DEBRIS OR HAZARDOUS MATERIALS AT ALL TIMES.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND/OR REPLACEMENT OF ANY ITEMS DAMAGED DURING CONSTRUCTION OR CLEAN UP. CONSTRUCTION PERSONNEL SHALL BE CONFINED TO THE LIMITS OF THE CONSTRUCTION AREA. ALL OSHA REGULATIONS FOR CONSTRUCTION AREAS SHALL BE STRICTLY FOLLOWED.

DISCREPANCIES

- A. THESE DRAWINGS SHALL BE UTILIZED IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS. REGARDING DISCREPANCIES OR CONFLICTS IN THE CONTRACT DOCUMENTS, THE MORE STRINGENT REQUIREMENTS WILL APPLY, UNLESS OTHERWISE DIRECTED BY THE CONTRACTING OFFICER.

- B. THE CONTRACTOR SHALL HAVE ALL ITEMS OR DETAILS CLARIFIED WITH THE CONTRACTING OFFICER PRIOR TO SUBMITTING A BID, OTHERWISE THE CONTRACTING OFFICER'S INTERPRETATION WILL BE FINAL.

- C. CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND SITE CONDITIONS RELATED TO THIS WORK. ANY DISCREPANCIES IN DIMENSIONS OR SPECIAL MODIFICATIONS REQUIRED DUE TO FIELD CONDITIONS SHALL BE REPORTED IN WRITING TO THE CONTRACTING OFFICER FOR CLARIFICATION OR APPROVAL. NO MODIFICATION PRIOR TO COMMENCING THE WORK. RESPONSIBILITY FOR ANY CHANGES TO THE WORK MADE IN THE FIELD WITHOUT PRIOR NOTIFICATION OR AUTHORIZATION FROM THE CONTRACTING OFFICER SHALL REST WITH THE CONTRACTOR.

8. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUBCONTRACTORS WORKING ON THE JOB SITE AND FOR ALL COORDINATION OF WORK AMONG THEM. THE SUBCONTRACTORS SHALL FULLY COORDINATE THEIR WORK WITH THE OTHER TRADES. THE SUBCONTRACTORS SHALL BE RESPONSIBLE FOR THE FINAL GATHERING OF ALL EQUIPMENT NOT FURNISHED BY THEM BUT REQUIRING THE SAME FOR FINAL COMPLETION.

9. ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE PROJECT SPECIFICATIONS.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL THE NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THE PROJECT.

11. ALL DIMENSIONS SHALL BE CONSIDERED NOMINAL UNLESS NOTED OTHERWISE. WRITTEN DIMENSIONS SHALL GOVERN. DO NOT SCALE DRAWINGS.

12. CONTRACTOR IS TO STAGE EQUIPMENT AND OTHER RESOURCES NECESSARY TO PERFORM THE WORK WITHIN THE CONSTRUCTION LIMITS AT LOCATIONS CONSISTENT WITH HIS WORK PLAN AND AS APPROVED BY THE CONTRACTING OFFICER. THESE STAGING AREAS CANNOT INTERFERE WITH DEDICATED STOCKPILE/STAGING AREAS ASSOCIATED WITH ADJACENT AND CONCURRENT WORK.

13. CONTRACTOR IS TO STOCKPILE DEBRIS WITHIN THE CONSTRUCTION LIMITS AT LOCATIONS CONSISTENT WITH HIS WORK PLAN AND AS APPROVED BY THE CONTRACTING OFFICER. THESE STOCKPILE AREAS CANNOT INTERFERE WITH DEDICATED STOCKPILE/STAGING AREAS ASSOCIATED WITH ADJACENT AND CONCURRENT WORK.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND PROPER DISPOSAL ACCORDING TO APPLICABLE STANDARDS AND PROJECT SPECIFICATIONS ALL NON-VEGETATIVE DEBRIS, TRASH AND GARBAGE, FROM THE PROJECT SITE. CONTRACTOR SHALL CLASSIFY AND STOCKPILE MATERIAL TO BE REMOVED FROM THE STOCKPILE SITE PER PROJECT SPECIFICATIONS AND IN SUCH A WAY AS TO NOT CROSS CONTAMINATE MATERIAL, OR CONTAMINATE UNCLASSIFIED MATERIALS AND REMOVAL FROM SITE SHALL BE COORDINATED WITH AND APPROVED BY THE CONTRACTING OFFICER. CONTRACTOR SHALL CLEAR AND GRADE TO PROJECT DRAWING AND SPECIFICATION REQUIREMENTS ALL AREAS PRIOR TO FINAL ACCEPTANCE BY THE CONTRACTING OFFICER.

15. COLLIER COUNTY AERIAL PHOTOGRAPHY (2005) WAS USED FOR OVERLAY.

16. ALL EXISTING INFORMATION HAS BEEN OBTAINED FROM THE BEST AVAILABLE SOURCES. THE LOCATIONS OF THE CANALS, ROADWAYS, TRAMS AND UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXISTING LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO DEMOLITION AND/OR CONSTRUCTION.

17. CONTRACTOR SHALL CLEAR ALL VEGETATION WITHIN THE LIMITS SHOWN ON THESE PLANS, ACCORDING TO REQUIREMENTS OF THE PROJECT SPECIFICATIONS. BURNING IS PERMITTED AS DETAILED IN THE SPECIFICATIONS.

18. FORTY EIGHT (48) HOURS PRIOR TO DIGGING, CALL SUNSHINE STATE ONE CALL OF FLORIDA, TELEPHONE NO. 1-800-432-4770 AND THE UTILITY OWNERS SHALL REQUEST UTILITY LOCATIONS. A CONTRACTOR'S REPRESENTATIVE MUST BE PRESENT WHEN UTILITY COMPANIES LOCATE THEIR FACILITIES.

19. UTILITY COMPANIES - NO KNOWN OPERATING UTILITY SERVICES WITHIN WORK AREA. SOME POLES AND TELEPHONE LINES EXIST ALONG 56TH AVE. BUT ARE NOT KNOWN TO BE OPERATIONAL. CONTRACTOR SHALL CONTACT LOCAL AREA UTILITIES TO DETERMINE STATUS AND ARRANGE FOR TEMPORARY SERVICE AS REQUIRED.

20. ALL EXISTING DRAINAGE STRUCTURES WITHIN THE LIMITS OF DEMOLITION AND/OR CONSTRUCTION ARE TO REMAIN, UNLESS OTHERWISE NOTED.

21. ANY PUBLIC LAND CORNER AND CONTROL MONUMENT WITHIN THE LIMITS OF DEMOLITION AND/OR CONSTRUCTION IS TO BE PROTECTED. THE CONTRACTOR SHALL VERIFY MONUMENT LOCATIONS PRIOR TO THE START OF DEMOLITION AND/OR CONSTRUCTION. IF ANY OF THE MONUMENT LOCATIONS ARE IN DANGER OF BEING DESTROYED AND HAVE NOT BEEN PROPERLY REFERENCED, THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER.

22. THE COORDINATES SHOWN REFER TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, TRANSVERSE MERCATOR PROJECTION, EAST ZONE, NORTH AMERICAN DATUM OF 1983, REVISION 1990.

23. THE SECTION LINES SHOWN ARE APPROXIMATE, AND WERE TAKEN FROM THE S.F.W.M.D. GEOGRAPHIC INFORMATION SYSTEM (GIS) SECTIONAL COVERAGE. THE CONTRACTOR SHALL VERIFY MONUMENT LOCATIONS PRIOR TO THE START OF DEMOLITION AND/OR CONSTRUCTION. IF ANY OF THE MONUMENT LOCATIONS ARE IN DANGER OF BEING DESTROYED AND HAVE NOT BEEN PROPERLY REFERENCED, THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER.

24. GRADES SHOWN ARE FINISHED GRADES, UNLESS OTHERWISE NOTED.

- A. RESTORE ANY PORTIONS OF THE EXISTING ROADWAYS THAT ARE TO REMAIN, WHICH ARE DISTURBED BEYOND THE LIMITS OF DEMOLITION AND/OR CONSTRUCTION, TO THEIR PRIOR CONDITION. RESTORATION SHALL BE AT THE CONTRACTOR'S EXPENSE.

- B. ALL GROUNDWATER MONITORING WELLS THAT NEED TO BE DISTURBED SHALL BE REPLACED OR ABANDONED IN ACCORDANCE WITH DISTRICT AND FDEP REQUIREMENTS AT THE CONTRACTOR'S EXPENSE. COORDINATE WITH THE CONTRACTING OFFICER.

- C. IMMEDIATELY NOTIFY THE CONTRACTING OFFICER UPON DISCOVERY OF CONTAMINATION OR SUSPECTED CONTAMINATION NOT ALREADY IDENTIFIED IN THESE DRAWINGS. FURTHER ACCESS IS TO BE DIRECTED BY THE CONTRACTING OFFICER. NOTIFY THE CONTRACTING OFFICER FOR ASSESSMENT AND REMEDIATION OF THE CONTAMINATION OR SUSPECTED CONTAMINATION. RETURN TO THE CONTRACTING OFFICER FOR APPROVAL OF THE REMEDIATION OR DETERMINATION OF NO CONTAMINATION AND AS DIRECTED BY THE CONTRACTING OFFICER.

25. CONTRACTOR SHALL USE STAKED SPLIT FENCE, AS NECESSARY TO PROTECT EXISTING DITCHES, CANALS AND ADJACENT WEIR PROPERTIES, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE CONTRACTING OFFICER. SEE SPECIFICATION 31.32.11 FOR REQUIREMENTS.

26. THE WEIRS ALONG THE SPREADER BERM SHALL BE LINED WITH CONCRETE ARMORING OR ARTICULATING CONCRETE BLOCK OR APPROVED EARTH LINING. THE WEIRS SHALL BE LINED ALONG THEIR TOTAL LENGTH, ON BOTH SIDES, AND FROM THE BOTTOM OF THE BERM OVER THE WEIR AND CONTINUING ON THE OUTSIDE OF THE BERM AS SHOWN ON THE CONSTRUCTION DRAWINGS. CONTRACTOR IS TO FOLLOW MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR THE INSTALLATION OF THE PRODUCT.

27. KEEP EXISTING AND NEW DRAINAGE STRUCTURES CLEAR OF PAVEMENT MATERIAL. ADJACENT AREAS SHALL BE PROTECTED FROM DEMOLITION AND/OR CONSTRUCTION AT NO ADDITIONAL COST.

28. TURBIDITY CONTROL AND MONITORING SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION GENERAL PERMIT FOR STORM WATER DISCHARGE FROM LARGE AND SMALL CONSTRUCTION ACTIVITIES OR AS DIRECTED BY THE CONTRACTING OFFICER.

29. REFER TO SHEET G300.03 FOR PROJECT CONTROL BENCHMARKS.

33. THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION.

34. ALL CONTOUR ELEVATIONS WERE OBTAINED BY UTM SURVEY AND IS ACCURATE WITHIN APPROXIMATELY 6 INCHES IN LOW VEGETATION AREAS AND PLUS OR MINUS 2 FEET IN HEAVILY VEGETATED AREAS. THE TE-BACK LEVEES AND SPREADER BERM ARE BASED ON FIRST ORDER SURVEY.

DESCRIPTION OF WORK:

1. THE CONTRACTOR SHALL CONSTRUCT THE PUMPING STATION, TE-BACK LEVEES, SPREADER BERM, WEIRS, CANAL PLUGS AND ROAD REWORK AS DESCRIBED IN THE SPECIFICATIONS AND AS SHOWN ON THE CONSTRUCTION DRAWINGS. SPECIFICALLY, CONTRACTOR IS TO:

1.1 CONSTRUCT BORROW CANAL

CONSTRUCT BORROW CANAL STARTING AT THE EAST SIDE OF THE PUMP STATION, ALONG THE NORTH SIDE OF 56TH AVE. THE BORROW CANAL WILL BE DISCONTINUOUS WITH THE BEGINNING AND ENDING COORDINATES SPECIFIED IN THE CONSTRUCTION DRAWINGS.

AN ADDITIONAL BORROW CANAL WILL BE EXCAVATED SOUTH OF THE TE-BACK LEVEE AT A DISTANCE SPECIFIED IN THE CONSTRUCTION DRAWINGS. THIS BORROW CANAL WILL BE CONTINUOUS AND WILL BEGIN AND END AT COORDINATES SPECIFIED IN THE DRAWINGS.

THE WEST REAR BORROW CANAL (WEST OF THE PUMP STATION) WILL BE DISCONTINUOUS. THIS BORROW CANAL WILL BE ON THE WEST SIDE OF MERRITT BLVD AND WILL BEGIN AND END AT LOCATIONS SPECIFIED IN THE CONSTRUCTION DRAWINGS. IT WILL FOLLOW SOUTH ALONG MERRITT BOULEVARD AND WILL TURN WEST AT 66TH AVE SE.

1.2 CONSTRUCT TE-BACK LEVEE

CONSTRUCT TE-BACK LEVEE ON EAST SIDE OF THE PUMP STATION, ALONG SOUTH SIDE OF 56TH AVE SE, FROM PUMP STATION AT STA. 116+86.36, EAST AND NORTH TO STA. 0+00.00, A SECONDARY ROAD SHALL PARALLEL THE NORTH SIDE OF THE LEVEE FOLLOWING THE ROUTE OF SE 56TH AVE, AS SHOWN ON THE CONSTRUCTION DWGS.

CONSTRUCT TE-BACK LEVEE ON WEST SIDE OF THE PUMP STATION, ALONG THE EAST SIDE OF MERRITT BOULEVARD, FROM PUMP STA. 128+58.82 WEST AND SOUTH TO STA. 236+59.27. A SECONDARY ROAD SHALL PARALLEL THE WEST SIDE OF THE LEVEE FOLLOWING THE ROUTE OF MERRITT BOULEVARD AND 56TH AVE SE.

CONSTRUCTION OF THE LEVEES SHALL FOLLOW SPECIFICATION SECTION 31.23.00.01.

1.3 CONSTRUCT SPREADER BERM AND WEIRS

CONSTRUCT A SPREADER BERM STARTING FROM STA. 99+00 WHERE IT MEETS THE TE-BACK LEVEE, WEST TO STA. 130+00 WHERE IT AGAIN MEETS THE TE-BACK LEVEE, FOLLOWING THE ALIGNMENT SHOWN ON THE CONSTRUCTION DRAWINGS. A BORROW CANAL WILL BE EXCAVATED STARTING AT N 655978.57 496065.53 AND ENDING AT N 656473.09 E 49492.06.

1.4 CONNECT BERSON AVENUE TO THE TE-BACK LEVEE

REWORK 52ND AVE SE (BERSON AVENUE), TO PRIMARY ROAD CATEGORY, FROM COORDINATE N 837030.03 E 49157.00 TO STA. 128+58.82. THE CONTRACTOR SHALL SCARIFY 12 IN. OF MATERIAL AND RE-COMPACT TO A STABLE SUB-GRADE, THEN ADD 6 INCHES OF COMPACTED LIMESTONE BASE OVER THE STABILIZED SUBGRADE ACCORDING TO SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS.

REALIGN AND REWORK FRANCIS STREET FROM ITS INTERSECTION WITH 52ND AVE SE, BERSON AVENUE TO THE PUMP STATION TO PRIMARY ROAD CATEGORY, AS SHOWN ON THE CONSTRUCTION DRAWINGS.

1.5 CONNECT TE-BACK LEVEE TO PUMP STATION ROAD

CONNECT EAST SIDE TE-BACK LEVEE AND ROAD TO PUMP STATION LEVEE AND ROAD AT STA. 116+86.36, AND WEST SIDE TE-BACK LEVEE AND ROAD TO PUMP STATION LEVEE AND ROAD AT STA. 128+58.82, AS DETAILED IN THE CONSTRUCTION DRAWINGS.

1.6 PLUG CANALS

INSTALL CANAL PLUGS ON MERRITT CANAL AT THE FOLLOWING LOCATIONS:

| | | |
|---------------|----------------|----------------------------------|
| 56TH AVE S.E. | 92ND AVE S.E. | 126TH AVE S.E. & PATTERSON BLVD |
| 58TH AVE S.E. | 94TH AVE S.E. | 126TH AVE S.E. & STANLEY BLVD |
| 60TH AVE S.E. | 96TH AVE S.E. | 126TH AVE S.E. & PARRIE CANAL(2) |
| 62ND AVE S.E. | 98TH AVE S.E. | 126TH AVE S.E. & PARRIE CANAL(1) |
| 64TH AVE S.E. | 100TH AVE S.E. | 128TH AVE S.E. & LYNCH BLVD |
| 66TH AVE S.E. | 102ND AVE S.E. | 132ND AVE S.E. |
| 68TH AVE S.E. | 104TH AVE S.E. | 134TH AVE S.E. |
| 70TH AVE S.E. | 106TH AVE S.E. | N 603457.47 E 493803.74 |
| 72ND AVE S.E. | 108TH AVE S.E. | N 603457.48 E 491921.80 |
| 74TH AVE S.E. | 110TH AVE S.E. | N 603426.67 E 490043.69 |
| 76TH AVE S.E. | 112TH AVE S.E. | N 614017.77 E 504592.97 |
| 78TH AVE S.E. | 114TH AVE S.E. | N 614002.40 E 503271.08 |
| 80TH AVE S.E. | 116TH AVE S.E. | N 613978.88 E 507651.59 |
| 82ND AVE S.E. | 118TH AVE S.E. | N 613965.90 E 500668.94 |
| 84TH AVE S.E. | 120TH AVE S.E. | N 612906.48 E 500552.51 |
| 86TH AVE S.E. | 122ND AVE S.E. | N 611577.30 E 500550.47 |
| 88TH AVE S.E. | 124TH AVE S.E. | N 610266.35 E 500534.88 |
| 90TH AVE S.E. | 126TH AVE S.E. | N 608860.73 E 500530.30 |

ALL CANAL PLUGS SHALL BE OBTAINED FROM BERM AND ROAD DEGRADING. SEE CONSTRUCTION DRAWINGS FOR PLUG DETAILS AND ACTUAL GRID LOCATIONS.

CONTRACTOR SHALL DEGRADE ALL SPILL PILES ALONG CANALS AND MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CANAL PLUGS.

1.7 REWORK AND REGRADE ROADS

CERTAIN ROADS, AS IDENTIFIED IN THESE DOCUMENTS, ARE TO REMAIN, OR BE REGRADED AS PRIMARY, SECONDARY OR TERTIARY ROADS. THESE ROADS HAVE SPECIFIC DEGRADING REQUIREMENTS. THE CONTRACTOR SHALL FILL THE ADJACENT SMALES AND ROAD DITCHES TO UNDISTURBED GROUND (+/- 3") USING SUITABLE MATERIAL RECOVERED FROM THE ADJACENT EXISTING ROAD AND BERM. ANY SURPLUS FILL MATERIAL SHALL BE BACKFILLED INTO CANAL. ALL MATERIALS FROM ROAD AND BERM DEGRADING SHALL BE USED TO FORM PLUGS. ANY EXCESS MATERIAL FROM ROAD DEGRADING OR EXISTING SPILL PILES SHALL BE BACKFILLED INTO CANAL. ALL VEGETATION ASSOCIATED WITH CLEAR AND GRUBBING ACTIVITIES SHALL BE PILED, ALLOWED TO DRY, THEN BE BURNED, AND ANY REMAINING LARGE WOODY DEBRIS PLACED IN OPEN SECTIONS OF THE CANAL THAT ARE NOT TO BE FILLED WITH SOIL MATERIAL.

1.8 DEMOLISH THE MERRITT CANAL CONTROL WEIRS

CONTRACTOR IS TO DEMOLISH AND REMOVE THE MERRITT CANAL CONTROL, LUCKY LAKE WEIR LOCATED AT THE END OF THE EXISTING 52ND AVE SE. AT COORDINATES N657022.73 E-49155.18, AND THE MERRITT NO. 7 WEIR LOCATED APPROX. 100FT. NORTH OF STEWART BLVD. AT COORDINATES N 260319.60 E812924.55. SEE WEIRS AND DETAILS ON CONSTRUCTION DRAWINGS.

1.9 INSTALL COMMUNICATION DUCT BANKS

INSTALL TWO (2) COMMUNICATION DUCT BANKS EACH WITH 4-2" IN. DIA CONDUITS AND ASSOCIATED PLUG BOXES AND MANHOLES ALONG EACH SHOULDER OF BERSON BOULEVARD (32 AVE SE) STARTING AT STA 0+00 AND TERMINATING AT STA 34+81.41, AS DETAILED IN THE CONSTRUCTION DRAWINGS.

THESE DUCT BANKS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE DOT STANDARDS, AND ARMY CORPS OF ENGINEERS DESIGN AND CONSTRUCTION OF LEVEES, ENGINEERING DESIGN MANUAL EM-1110-2-1913, APRIL 2000.

1.10 ACCESS RAMPS

CONSTRUCT ACCESS RAMPS FROM THE WEST SIDE OF THE WEST TE-BACK LEVEE TO ACCESS THE LEVEE AT THE FOLLOWING LOCATIONS: 58TH AVE SE, 66TH AVE SE, AS INDICATED IN THE CONSTRUCTION DRAWINGS.

1.11 ACCESS GATES

INSTALL ACCESS GATES ON THE ROADS, AT THE FOLLOWING LOCATIONS: STA 33+00; 1+52.44; 116+52.10, AND 220+33.15 AS SHOWN ON THE CONSTRUCTION DRAWINGS.

2. CONTRACTOR IS TO CLEAR LINES OF SIGHT ALONG THE ALIGNMENT OF THE VARIOUS LEVEES, SPREADER BERM, CANAL PLUG LOCATIONS, ROADS, ETC. TO PERFORM A SURVEY BEFORE START OF CONSTRUCTION TO ESTABLISH THE ELEVATION OF THE UNDISTURBED GROUND IN THE AREAS WHERE CONSTRUCTION IS TO TAKE PLACE.

AFTER COMPLETION OF WORK, THE CONTRACTOR SHALL PERFORM A SURVEY OF THE FINISHED FACILITIES, LEVEES, SPREADER BERM, CANAL PLUGS AND ROADS TO ESTABLISH THEIR FINISHED, ACTUAL ELEVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 31.23.00.02 OF THE TECHNICAL SPECIFICATIONS, AND AS NOTED IN THE DRAWINGS.

3. THE RESULTS OF THE SURVEYS SHALL BE PRESENTED IN TABULAR FORMAT AND AUTOCAD FORMAT DRAWINGS.

4. SUITABLE EXCAVATION MATERIAL, THAT IS REMOVED SHALL BE REUSED AS FILL MATERIAL FOR THE CANAL PLUGS, SMALES, LEVEES, ETC.

5. ANY EXCESS MATERIAL SHALL BE TEMPORARILY STOCKPILED FOR FUTURE USE ON SITE AS PLUG MATERIAL AT A LOCATION SPECIFIED BY THE CONTRACTING OFFICER.

6. STAGING AREAS: 56TH AVENUE SE WEST OF MERRITT BOULEVARD IS THE DESIGNATED STAGING AREA FOR THE MERRITT CANAL PUMP STATION WORK AND IS TO REMAIN AS SUCH UNTIL COMPLETION OF THE WORK. AT THAT TIME 56TH AVENUE SE SHALL BE REWORKED TO THEIR FINAL CONFIGURATION ACCORDING TO SPECIFICATION AND CONSTRUCTION DRAWING REQUIREMENTS.

7. THE FOLLOWING BRIDGES ARE TO BE REMOVED: 68TH AVE SE, STEWART BLVD AND 161TH AVE SE.

8. THE FOLLOWING ROADS ARE TO HAVE ANY EXISTING ASPHALT AND GROUND REMOVED AS FOLLOWS: BERSON AVENUE WILL HAVE ASPHALT REMOVED FROM COORDINATE N-657022.73 E-49155.18 TO FRANCIS ST.

9. ASPHALT THAT IS STRIPPED FROM THE EXISTING ROADS SHALL BE GROUND AND STOCK PILED FOR USE BY THE FLORIDA DIVISION OF FORESTRY. THE GROUND ASPHALT SHALL BE STOCK PILED IN WINOWS ADJACENT TO THE HARDY PIT WITHIN THE AREA DESIGNATED ON R301.02. THE WINOW SHALL NOT BE HIGHER THAN 10 FT ABOVE UNDISTURBED GROUND ELEVATION, AND SHALL BE INCURED AT THE NATURAL ANGLE OF REPOSE FOR THE MATERIAL. THE CONTRACTOR SHALL REMOVE ANY VEGETATION WITHIN THE STOCK PILE AREA BEFORE LAYING DOWN THE STOCKPILE.

10. THE FOLLOWING ROADS ARE TO BE REWORKED OR DEGRADED AS FOLLOWS: 56TH AVENUE SE, 58TH AVENUE SE, 60TH AVENUE SE, 62ND AVENUE SE, 64TH AVENUE SE, 66TH AVENUE SE, AND 68TH AVENUE SE. THE ASPHALT WILL BE REMOVED FROM THESE ROADS 50 FEET FROM TOP OF BANK OF BORROW CANAL ALONG MERRITT BOULEVARD, MERRITT BOULEVARD FROM BERSON AVE TO 150' SOUTH OF 66 AVE WILL BE DEGRADED AND COMPACTED TO SECONDARY ROAD CONDITIONS. 56TH AVENUE SE WILL BE DEGRADED AND BACKFILLED INTO CANAL AS PLUG MATERIAL. 56TH AVE SE, 58TH AVE SE, 60TH AVE SE, 62ND AVE SE, 64TH AVE SE, AND 66TH AVE SE FROM MERRITT BOULEVARD TO MERRITT CANAL. EXISTING ASPHALT SHALL BE REMOVED AND STOCKPILED AT THE LOCATION SHOWN ON SHEET R301.02 (MERRITT ROAD REMOVAL).

11. CONTRACTOR WILL HAVE THE OPTION TO BROOM IN CRUSHED LIMESTONE TO THE SITE OR CHARGE THE SIZE OF THE BORROW CANAL. CONTRACTOR SHALL OBTAIN THE CRUSHED LIMESTONE FROM THE APPROVED FOOT STANDARDS FOR LIME ROCK BASE. FOOT STANDARDS SPECIFY THAT AT LEAST 97% (BY WEIGHT) OF THE MATERIAL SHALL PASS A 3/8" INCH SIEVE AND THE MATERIAL SHALL BE GRADED UNIFORMLY DOWN TO 20% RET.

12. CONTRACTOR IS TO MAINTAIN ACCESS TO PUBLIC ROADS DURING CONSTRUCTION.

13. INSTALL STILLING INTO WEIRS AT I-75 AND LUCKY LAKE.

TYPICAL DETAILS

TYPICAL DETAILS APPLY TO ALL APPROPRIATE LOCATIONS UNLESS OTHERWISE NOTED ON THE DRAWINGS. TYPICAL DETAILS MAY BE MODIFIED TO SUIT FIELD CONDITIONS WITH THE REVIEW AND APPROVAL OF THE CONTRACTING OFFICER.

MEANS AND METHODS

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF DEMOLITION AND/OR CONSTRUCTION. DRAWINGS SHOW FINISHED PRODUCT N-PLACE AND DO NOT IN ANY WAY SUGGEST OR OTHERWISE PRESCRIBE A MEANS AND/OR METHOD OF DEMOLITION, INSTALLATION OR CONSTRUCTION.

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JACKSONVILLE DISTRICT
CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

U.S. ARMY CORPS OF ENGINEERS
JACKSONVILLE DISTRICT
JACKSONVILLE, FLORIDA

PICAYUNE STRAND RESTORATION PROJECT
MERRITT PUMPING STATION
CIVIL

CONTRACT NO. W-09-0003
DRAWING NO. 1.310.01
SHEET
5 OF 314

1.6 PLUG CANALS

INSTALL CANAL PLUGS ON MERRITT CANAL AT THE FOLLOWING LOCATIONS:

| | | |
|----------------|-----------------|----------------------------------|
| 56TH AVE. S.E. | 92ND AVE. S.E. | 126TH AVE. S.E. & PATTERSON BLVD |
| 58TH AVE. S.E. | 94TH AVE. S.E. | 126TH AVE. S.E./PRARIE CANAL(1) |
| 60ND AVE. S.E. | 96TH AVE. S.E. | 126TH AVE. S.E./PRARIE CANAL(2) |
| 62ND AVE. S.E. | 98TH AVE. S.E. | 128TH AVE. S.E./LYNCH BLVD |
| 64TH AVE. S.E. | 100TH AVE. S.E. | 130TH AVE. S.E. |
| 66TH AVE. S.E. | 102ND AVE. S.E. | 132ND AVE. S.E. |
| 68TH AVE. S.E. | 104TH AVE. S.E. | 134TH AVE. S.E. |
| 69TH AVE. S.E. | 106TH AVE. S.E. | N: 603478.47 E: 493803.74 |
| 70TH AVE. S.E. | 108TH AVE. S.E. | N: 603457.48 E: 491921.80 |
| 72ND AVE. S.E. | 110TH AVE. S.E. | N: 603426.67 E: 490043.69 |
| 74TH AVE. S.E. | 112TH AVE. S.E. | N: 614014.77 E: 504592.97 |
| 76TH AVE. S.E. | 114ND AVE. S.E. | N: 614002.40 E: 503271.06 |
| 78TH AVE. S.E. | 116TH AVE. S.E. | N: 613978.88 E: 501951.59 |
| 80TH AVE. S.E. | 118TH AVE. S.E. | N: 613965.90 E: 500669.94 |
| 82ND AVE. S.E. | 120TH AVE. S.E. | N: 612906.48 E: 500552.51 |
| 84TH AVE. S.E. | 122ND AVE. S.E. | N: 611577.30 E: 500550.47 |
| 86TH AVE. S.E. | 124TH AVE. S.E. | N: 610266.35 E: 500534.88 |
| 88TH AVE. S.E. | 126TH AVE. S.E. | N: 608860.73 E: 500530.30 |
| 90TH AVE. S.E. | | |

FILL FOR CANAL PLUGS SHALL BE OBTAINED FROM BERM AND ROAD DEGRADING. SEE CONSTRUCTION DRAWINGS FOR PLUG DETAILS AND ACTUAL GRID LOCATIONS.

CONTRACTOR SHALL DEGRADE ALL SPOIL PILES ALONG CANAL. THIS MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CANAL PLUGS.

Merritt Canal Phase Plans

**CONTRACTOR SHALL DEGRADE
ALL SPOIL PILES ALONG CANAL.**

**THE MATERIAL SHALL BE USED
FOR THE CONSTRUCTION OF
CANAL PLUGS.**



Merritt Canal

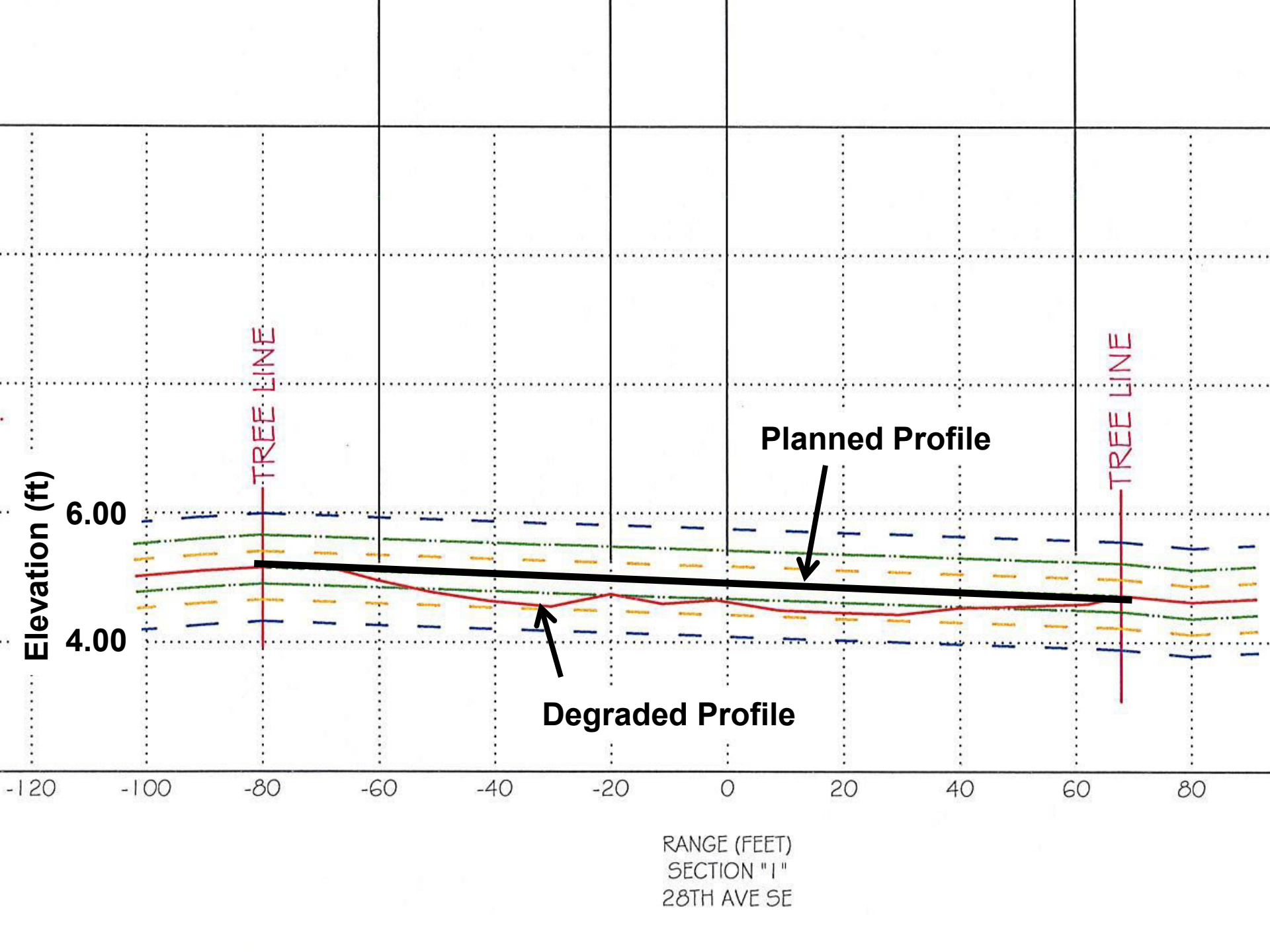




**Filling 8.5 Miles of Merritt Canal
(February 19 – June 12, 2015)**

Getting Road to Natural Grade

- Originally Specified ± 6 in for Phase 1
- In Merritt and Faka Union P&S Was ± 3 in
 - But a Major Problem for Contractor
- New Criteria Based on Natural Topography
 - Within ± 3 in at Least 60% of Time
 - Greater Than ± 6 in no more than 5% of Time
 - Always Within ± 10 in



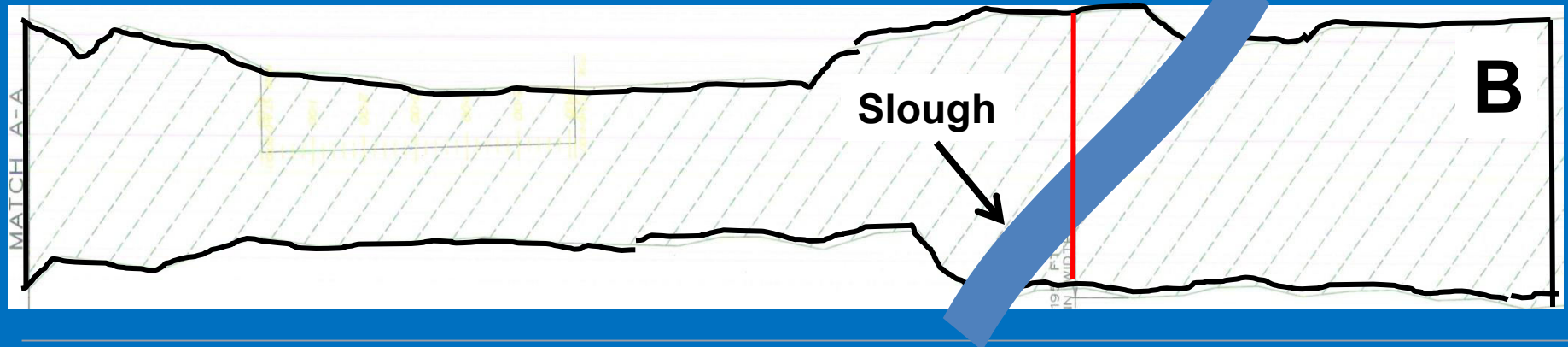
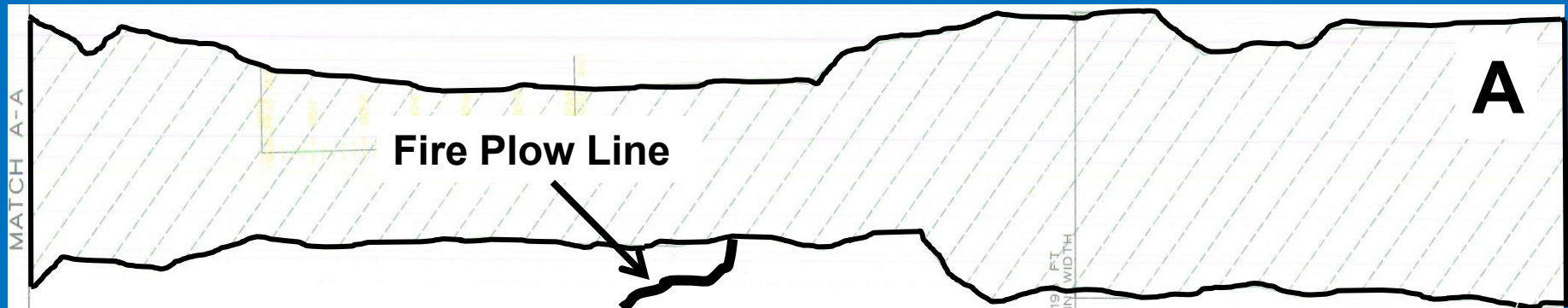


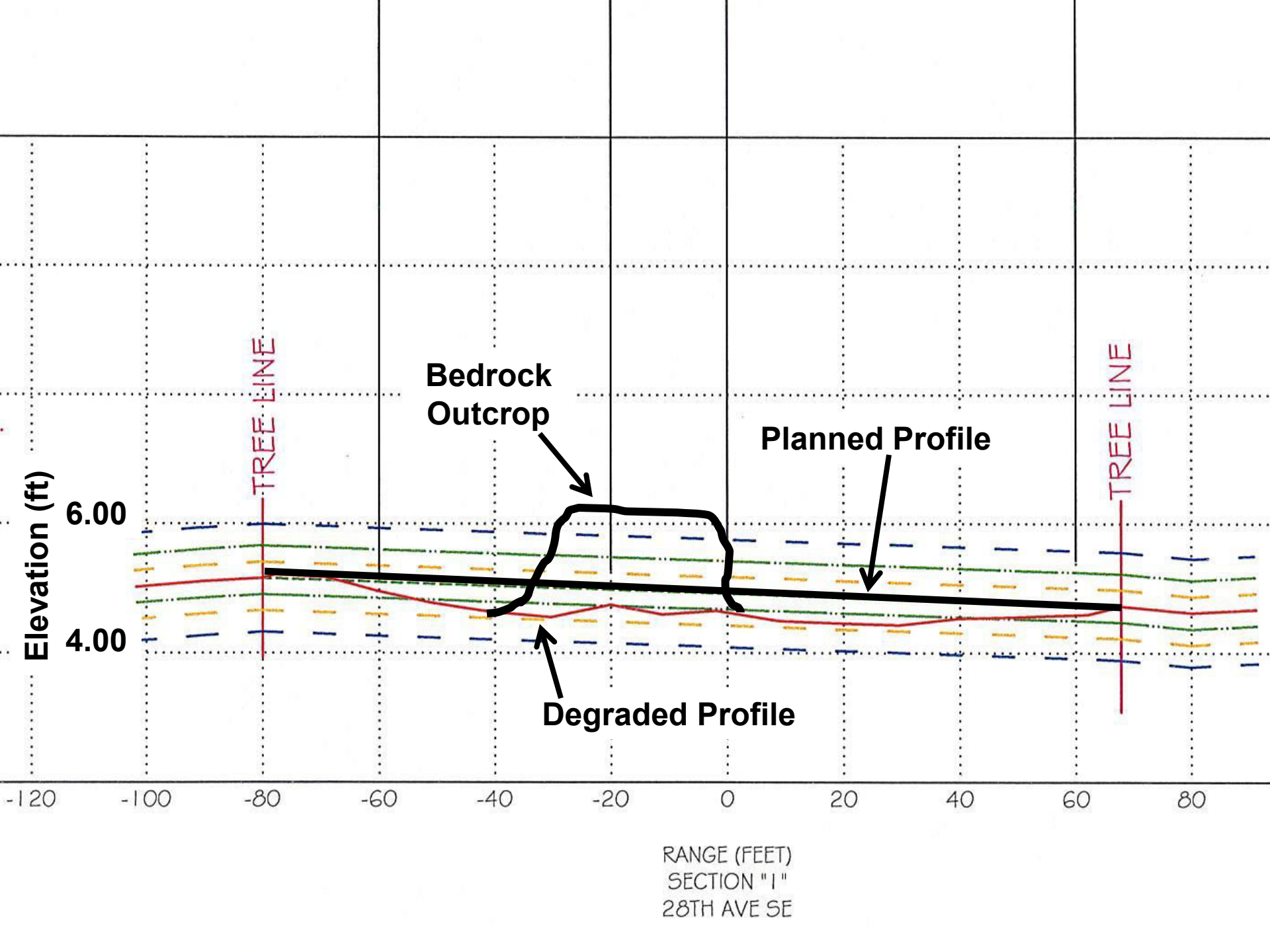


Landscape Features Requiring Modification of Contract Specifications

A. Fire Plow Line Spoil Berm Not Part of Project

B. Wetland Slough Crossing the Road



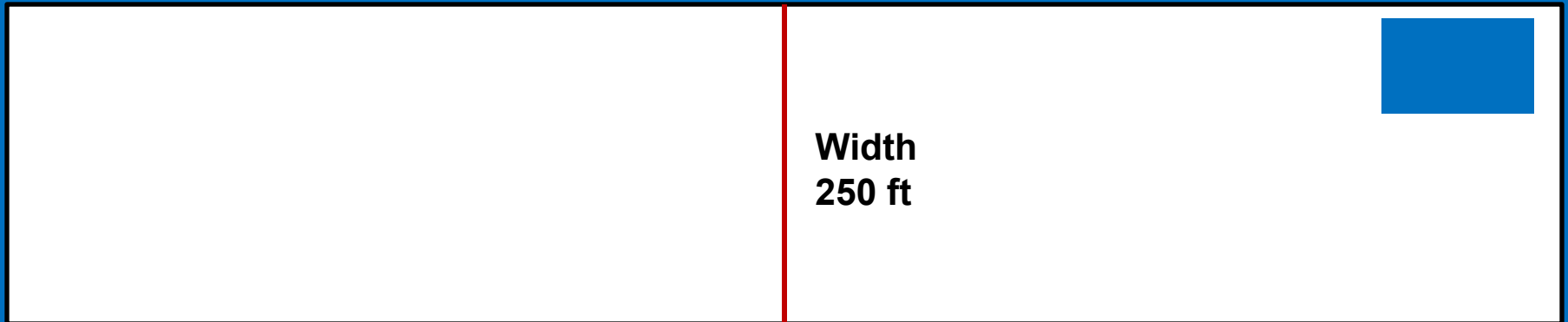
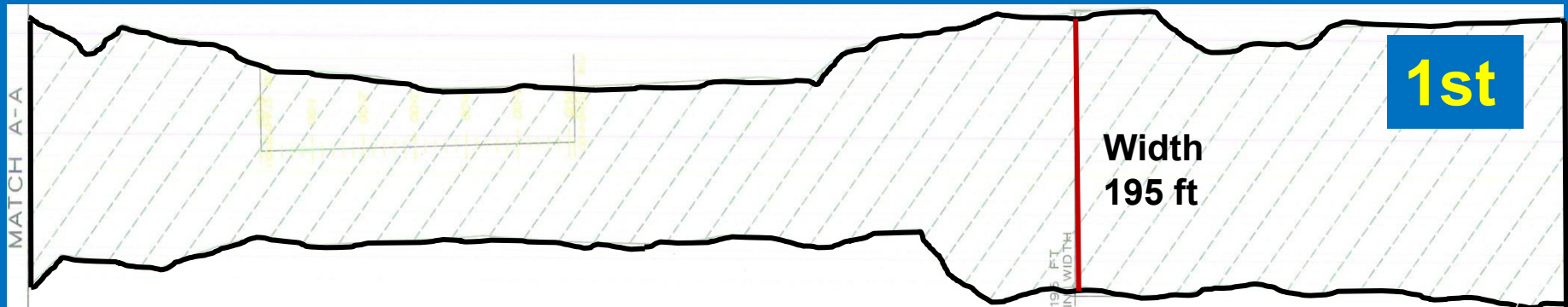




Width of Clearing - To Outside Edge of Spoil
Approximately 250 ft (Varies)

First Contractor – Paid by the Linear Foot of Road

Second Contractor – Paid by the Acre of Cleared Area

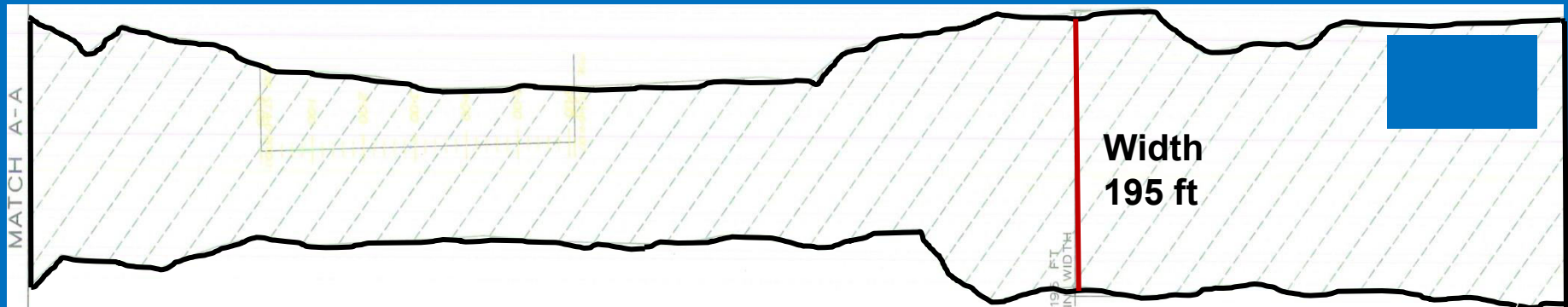


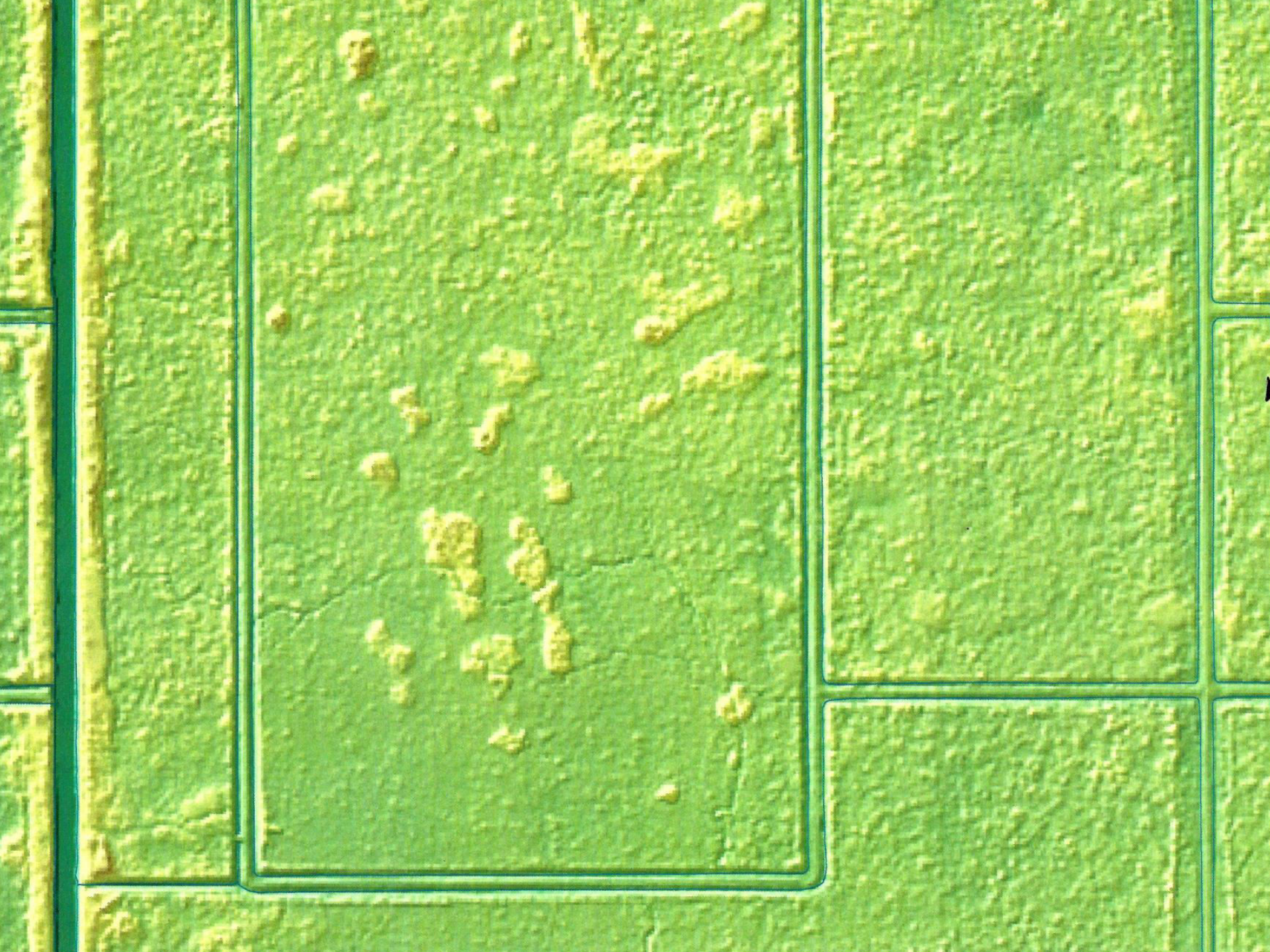


Width of Clearing - To Outside Edge of Spoil Approximately 250 ft (Varies)

First Contractor – Paid by the Linear Foot of Road

Second Contractor – Paid by the Acre of Cleared Area







115 ft

140 ft

200 ft

245 ft

Degraded Spoil along Canal 125 ft Wide Footprint and Centered on Canal



Ecological Oversight During Construction

- **Respond to Ecological Questions from People Doing the Construction**
- **Respond to Technical Questions from Knowledgeable Public during Construction**
- **Expediently Address Problems that Arise during Construction That Could Significantly Diminish the Success of the Final Project**
- **Assure Project is Being Constructed as Designed from an Ecological Perspective**

**“...hard to recognize, but there used to be a canal somewhere
in the foreground - Merritt “**

Happy New Year - 2016 Joss Nageon de Lestang

